Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

should be taken that the water used for washing is chemically pure, or else crystals will be formed, attaching the diatoms to each other or to the slide. Moreover, if all the acid has not been washed out, crystals will likewise be formed. As an instrument for picking up the diatoms, a sharpened swine's bristle or a mouse's whisker will be found most excellent. If the experimenter wishes to mount them free-hand under the microscope, this bristle may be fastened to a pen-holder or any handle by means of a drop of wax or Canada balsam. Since a diatom $\frac{1}{1500}$ of an inch long is considered above the average size, and few of the varieties found about here are of the larger varieties, one finds free-hand mounting almost an impossibility. I experimented for three months last spring, and was rewarded by a loss of patience and enthusiasm, but succeeded in acquiring a steady hand, and alas! but five mounts. By using the mechanical finger, however, I have succeeded within the last month, working at odd moments, in selecting out and mounting about fifty varieties. All these varieties have been selected from collections made from one stream. I usually select out eight or ten of a variety and transfer them to a cover-glass lightly coated with glycerine. The glycerine is evaporated by the heat of an alcohol lamp, leaving the diatoms firmly attached to the cover-glass. A drop of Canada balsam is placed upon a slide, and the cover-glass is gently dropped upon the balsam. The slide is kept for several days with the cover-glass side downward until the balsam is sufficiently hardened to prevent any change of position taking place.

I might venture to add that, like other plants, certain varieties of diatoms seem to flourish at different seasons of the year. Perhaps my observations are too limited to allow me to make, with any definiteness, such a statement. From the same ravine, however, I made collections last February and May. The varieties that prevailed in February were fewer in May. Collections made from the same place in September of this year show that varieties seldom seen in the spring — for example, Pleurasigma, Navicula, and some of the Surirella, as robusta, are plentiful. While some varieties so common in the spring, as Surirella spiralis, I have failed to find at all this fall. Whether these varieties "run out," so to speak, and regenerate more frequently than once a year, that is, at more than one season of the year, I cannot of course determine from but one year of observation. It is evident that they have resting seasons. I might add, however, that some varieties, as Synedra, seem to be uniformly distributed throughout the seasons.

A COMPARISON OF PRESERVATIVE FLUIDS FOR MUSEUM USE.

BY V. L. KELLOGG AND E. E. SLOSSON, LAWRENCE.

[*Abstract.*]

A satisfactory preservative fluid for museum use, especially for the preservation of insect forms, is a desideratum of much importance. Much trouble and lack of success is experienced in the endeavor to preserve specimens without shrinkage, or swelling, or loss of color. A satisfactory preservative fluid for biological collections in entomology must perfectly, or as nearly perfectly as possible, preserve the animal tissue from deterioration, and must not change the colors. Alcohol is the most commonly-used preservative fluid, but while preserving the tissues, it affects colors in almost all cases. Specimens kept in glycerine frequently retain their colors, but are likely to fall to pieces on being handled. Carbolic acid effects marked changes in the tissues.

The experimenters have prepared an extensive series of preservative fluids, solutions of salicylic, boracic, and similar acids, naphthalene and the metallic chlorides, separately and in combination, and in various strengths of alcohol and glycerine.

With these fluids, tests are being made by immersing insect larvæ and imagines, of all of which specimens careful notes respecting color and measurements are made before immersion in the fluids. Inspection is made frequently, and any changes in the specimen are noted. Especially valuable results are expected from simultaneous experiments on a large number of larvæ of the same species of lepidoptera. For example, a number of larvæ of an Arctian moth. all taken at one time and all of nearly equal age, introduced into a series of different fluids, show especially well by comparison the effects of the various preservative agents.

The experimenting was begun too recently to allow of any collaboration of results thus early. At a future meeting of the Academy, the experimenters hope to present the result of their work.

IMAGINARY FOCAL PROPERTIES OF CONICS.

BY H. B. NEWSON, LAWRENCE.

In modern geometry, the foci of a curve are defined as the points of intersection of the tangents to the curve from the imaginary circular points at infinity. Since four such tangents can be drawn to a conic, and since four lines intersect in six points, it would seem that every conic has six foci. But the circular points at infinity count for two; so there are only four finite foci, two real, and two imaginary. Many authors refer to the existence of the imaginary foci. C. Smith, in his conic sections, page 205, has shown that the imaginary foci are a pair of conjugate imaginary points, situated on the minor axis equi-distant from the center. Elsewhere (Annals of Math., vol. V., page 1) I have called attention to the fact that imaginary focal properties of conics may be developed which are the counterparts of the real focal properties.

I propose in this paper to set down in parallel columns the real and imaginary focal properties of conics, so that the reader can see at a glance what theorems concerning imaginary foci correspond to known theorems concerning real foci. I shall give first the theorems for the ellipse. They are given without proof. The simplest method of proof for the imaginary properties is to change a into b, and x into y, in the ordinary demonstration of the real properties.

REAL.	IMAGINARY.
The sum of the distances of any point on an ellipse from the real foci is constant, and equal to $2a$.	The sum of the distances of any point on an ellipse from the imaginary foci is constant, and equal to $2b$.
The real eccentricity is $e=\sqrt{\frac{a^2-b^2}{a^2}}$.	The imaginary eccentricity is $\acute{e}=\sqrt{\frac{b^2-a^2}{b^2}}$.
The distance of either real focus from the center is ae.	The distance of either imaginary focus from the center is $b\acute{e}$.
The length of the real semi-latus rectum is $a(1-e^2)$.	The length of the imaginary semi-latus rectum is $b(1-\acute{e}^2)$.
The lengths of the real focal radii are $a \pm ex$.	The lengths of the imaginary focal radii are $b \pm \acute{e}y$.